REPORT:

FACT-FINDING VISIT TO NEW YORK TO STUDY IMPLICATIONS OF INCORPORATING SCHOOLS IN MULTI-USE BUILDINGS.

1970

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Public attention has been aroused by articles and reports that in New York construction of multi-use high-rise buildings have included schools at no cost to the taxpayers. The suggested effect of this coordination of school construction with private enterprise prompted the Minister of Education to seek further information. The suggestion of visiting New York was broached to city school boards and later a meeting was held to explore categories of desired information. Soon afterwards the government authorized a committee to visit New York in March, 1970, to hear directly about the proposals, see the progress effected, and to assess in what manner such procedures might facilitate the building and financing of schools in Alberta.

School Boards and Councils in Edmonton and Calgary were invited to send representatives also, as it was acknowledged that these authorities would have primary interests in the New York developments and possible application to conditions here. Thus the visiting team was comprised of:

(1) Appointees of the Government

- L. G. Hall, Chairman, School Buildings Board
- D. Menzies, Architect, Department of Public Works
- W. R. Davies, Architect, Department of Public Works
- J. Polonuk, Planning Division of the Department of Municipal Affairs

(2) Representatives of School Boards

- Mr. D. Cote, Chairman, Calgary Separate School Board
- Mr. Vern Johnson, Chairman, Edmonton Public School Board
- Mrs. W. R. MacDonald, Member of the Edmonton Separate School Board
- Mr. W. Pasternak, Architect with Edmonton Separate School Board

(3) City Representatives

- Mr. T. Priddle, Alderman, City of Calgary
- Mr. T. Nugent, Alderman, City of Edmonton
- Mr. S. C. Rogers, Planning Committee, City of Edmonton

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Mr. L. Messier accompanied the team as he had earlier expressed special interest in the subject and had previously visited the projects and submitted conclusions to the Minister.

The team went to New York in March, 1970 consulted with officials of the Education Fund, visited some projects, and interviewed various officials associated with different aspects of the development. The task force also met with the architect and other personnel of the New York Board of Education. Nine school sites were visited plus one under construction and one completed school-apartment project which being private was not a part of the Education Fund Program.

Though previous committee discussions were limited the professional knowledge and varied experience of the members directed attention to particular features of the project developments. Concern was shown for the legal, financial, and educational implications, as well as the architectural and environmental factors.

Background

The New York City Educational Construction Fund is an agency created to promote school construction in multi-use high-rise structures and is legally authorized to finance the school section of such structures. It purports to promote a flexible program of urban development through careful utilization of land and air space, financing outside the usual debt limitations, and expanding integrated building functions for balanced community development. The Board of Education does not have title to its schools or sites as all school properties and air rights over them are owned by the city. In an area where high-rise buildings on all available land surround a school of few stories on a site with some extra land, it is readily understandable that some developer might offer to pay for use of the land and the air space above it for a

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large building that would include school accommodation. The scarcity of land for commercial development certainly gave impetus to the proposals.

In 1965, the New York legislature authorized the sale, lease, or transfer of air rights associated with school development to limited profit companies for middle-income housing. The statute did not specify the type of combined occupancy nor clarify any problem of competitive bidding of separate contracts for the school portion of any combined occupancy structure. Difficulties were foreseen arising from two or more elements of a combined structure being under two or more unrelated contractors who had varying degrees of independent action. A problem was also indicated concerning the nature of ownership by various interests. Thus legislation* provided for an inherent partnership between the government and the private sector in financing and development of a single structure containing both public and private ownership and public and private uses.

*Statute 999 specified:

1. creation of a nine-member Public Authority or Fund (as it is called)
   -President and 4 members of Board of Education,
   -4 members appointed by Mayor,

2. three-fourths vote needed on all important decisions,

3. certain actions or decisions of The Fund are subject to approval by various municipal officials-the corporation counsel, Property Commissioner, City Comptroller, and Budget Director,

4. The Board of Education must approve of site selection, design and construction, etc. of the school portion of the combined occupancy structure as well approve of the architectural concept of the non-school portion.

5. Provision for prequalification of eligible developers by School Board of Education and approval by the Board and Corporation Counsel (City Solicitor) of contracts, leases, and other agreements between the Fund and the Developers.

6. Limits the Fund's activities to the development of schools in combined occupancy structures and prohibits the use of the debt-free financing to build independent school structures.

A later statutory amendment provided that:

7. Separate contracts for sub-trades were required though each sub-contractor is responsible to the developer who in turn has agreement with The Fund.

8. The Fund, when it acquires the school section, leases it to the City for use by the Board of Education and the City pays an amount of rent after application of revenues from the non-school portion. Such rent cannot exceed the average cost of rental of comparable new school facilities in the City.

9. A "Capital reserve fund" must be maintained to protect the bondholders; the obligation to make up deficiencies in the Fund is imposed on the City. If the City fails to meet this inadequacy the Act mandates a first lien on State aid paid to the City for educational purposes.

10. Many other provisions.

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OBSERVATIONS

Ordinarily, funds for school construction are requisitioned annually by the Board of Education for budgetted capital expenditures and sometimes loans were arranged by the City without State assistance. There were limitations upon the amount of debt incurred. Choice school sites, few-storey schools, and urgent need for more use of the sites and air space promoted the idea that larger multi-use structures could supplement or replace existing schools.

In 1966 a special agency or Fund was legally established to promote the arrangements for multi-use schools by selecting sites, attracting developers, and funding the school portions by bond issues. The Fund had a special grant of $85,000.00 from the Educational Facilities Laboratories to initiate studies. It expected to sell 6% bonds on the open market and did sell some at less. The State may guarantee the annual payments of debenture if rent revenue is insufficient.

The Fund acquires the sites from the city and conveys the necessary interests to a developer according to agreement that he will construct in a combined occupancy building a separate but integral element comprised of classrooms and other facilities specified by the Board of Education. Practical problems related to services and control have promoted building the school section apart from the rest of the projects on the one site.

The school section is to be financed by the Fund through notes or 40-year bond issues for which tax-exemption has been declared by the State. The non-school portion is financed by the developer independently of the Fund.

The City's limitations of maximum indebtedness to 2% of its assessment impedes financing of many needed facilities including schools. The Fund was intended to act as a public benefit corporation outside this indebtedness limit. Its proposals were attractive for selling tax exempt bonds and bond anticipation notes which are State-assured in case of insolvency. It is understood that because the Fund is a Public Benefit authority it can issue bonds on which the dividends are tax-free. One bond issue of about $3,000,000.00 was sold at 5 3/8%.

The Fund develops appropriate concepts for combined use, promotes developers' interest through advertizement of desires, and selects one for a particular project. The developer proposes plans for the school space as well. The total proposals are viewed by the Fund not as a "call for tenders" where the low bidder is awarded the project, but as a subjective decision as to which offers the best use of the site with regard for cost. Then the price for the school portion is negotiated with the developer so that the Fund may issue bonds for that amount and the developer concludes his financing for the non-school portion which may be above or adjacent to the school section depending on the concept. When construction is finished the school section will be released, reconveyed, or leased back to the Fund and the developer will retain the air rights or other space rights in such other portions of the site necessary for lawful occupancy, and the use of the non-school section to which he will have title as well as necessary easements and leases. The Fund holds fee title to the underlying site and leases the school part to the City for use by the Board of Education. The rent paid by the City to the Fund should not exceed the rental cost of comparable facilities. However, it should be set as the amount required, if any, to pay the Fund's debt service on bonds or notes issued for the

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project after application of revenues received from the non-school portion. Such rent cannot exceed the rental cost of any comparable facilities but these revenues might be sufficient that the City need pay no additional rental on the school section which may be interpreted that the school building costs nothing to the taxpayer.

In case, however, the non-school section yields insufficient income, the City may pay rental equal to the debt service of principal and interest, plus the operation costs of the Fund less amounts collected in rental and tax

It was also noted that the developer would pay to the Fund:

(a) the "fair market value" of the air or space rights and such other space occupied by the non-school structure,

(b) plus an amount equal to the real estate taxes.

In the initial proposal the value of lease of air rights would be established usually for 75 years although legislation permits 99 years duration. Because the sites are owned by a public service authority they are tax exempt. But this exemption applies only to the school portion and the developer must pay a sum equivalent to the taxes on the value of the non-school portion.

The Board of Education had some experience in renting school space in apartment houses near existing schools and in two other cases the Board leased some air rights to get some school accommodation in public buildings.

The Trinity School was part of a private development where a high-rise apartment was built beside the school on the same school site and it was hoped the revenue therefrom would pay all annual indebtedness

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[illegible] the [illegible] and [illegible] values of the [illegible] space [illegible]

[illegible] and [illegible] supplied by the [illegible] school [illegible].

b) [illegible] an [illegible] to the [illegible] schools [illegible].

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[illegible]

costs including those of the school as the tuition fees ranging up to $1,000 per student did not provide sufficient revenue. Parking was provided on a roof over one section and another roof area of some 5000 sq. ft. covered with astro-turf served as a playground.

Noteworthy among the features of the total development were the restrictions of space and the inferior quality of finishing. A somewhat low quality of construction was also evident in the Highbridge Public School project even in its embryonic development. The standard of design in some proposals indicated limitations of space that might arouse dissatisfaction when the buildings come into use.

Considerable planning had been effected though little actual construction had commenced. Thirteen school sites had been approved which should provide for 11,590 pupils, 3474 apartments and about 350,000 sq. ft. of commercial development at an expected cost of 51 millions. Included in proposals were:

Public School 99 at Manhattan, Park Avenue and 34 St. envisages a commercial high school for 2,500 pupils costing 12 millions and an office complex of 350,000 sq. ft. at an estimated cost of 14 millions. Drawings have been started for 5 more of them. One of these, P.S. 124 at Bowery and Division Streets, Chinatown incorporates two circular apartment towers and a circular freeway system below the high school at an estimated cost of 19.5 millions. A well-protected playground is to be enclosed. Another is a $12,000,000 school and apartment complex planned for Yorkville. Still another is for an addition to a school which will add 140 apartments. Mortgage applications and the type of housing were being studied.

The Public School No. 126 in the Highbridge area was under construction for 1200 students. The development on the site includes 400 apartments as well but these were being constructed in a separate building beside the school structure because of some difficulty in providing separate services in one building.

The Site Selection Board was considering ten more proposed sites for about 7370 pupils and 3870 apartments.

The estimated cost of the 23 proposed projects is about 199 millions for the non-school residential or commerical portions and about 80 millions for the school sections which should accommodate about 18,960 students. This $4200 cost per pupil is over three times the capital cost in Alberta.

However, the proposals have arisen partially, because of the scarcity of land for residential and commercial development and the very high cost for it. Some of it has been valued at from one to two millions an acre. They have been further stimulated by the hope that the revenue from the non-school sections would reimburse expenditures for the school accommodation. It is also significent that of the existing 900 schools in the city, at least half need replacement or additional facilities.

Moreover, there is need for land for city-subsidized low and moderate rent housing. In adjacent areas as well there is urban renewal and there is need to provide social and economic renewal in areas not covered by existing Government programs without increasing the tax burden. Coordination of education and housing programs is envisaged by the Fund.

[illegible]

The Fund does not guarantee that there will be no rental for the school. There is also a requirement for a State reserve fund to cover debt service guarantees. Furthermore, there is no financial protection of the authorities involved to cover an error by the developer or to compel him to continue in an uneconomical operation.

The proposals appear as a form of credit buying on relatively high long-term costs that could devolve on both city and state.

The proposals for multi-use schools showed regard for zoning restrictions and possible relaxation for open space provisions. The non-school uses were expected to be compatible with adjacent community features.

It is apparent that the multi-use concept arose out of necessity--the high price of land and the need for more of it for commercial development, housing, and other features of urban renewal in a city of very limited resources.

CONCLUSIONS

Among the team members agreement prevailed that the necessities that impelled the action in New York were not generally applicable in Edmonton or Calgary. The conditions relative to availability of land or high costs for it were not comparable to those in Alberta.

It is also noted that no projects had yet been completed to provide appraisal of the Fund operation.

Comments on conclusions may be classified in various categories as:

I Financial Factors

II Legal Implications

III Features Related to Structure and Architectural Design

IV Planning

V Environmental and Educational Considerations

I FINANCIAL FACTORS

Estimates of costs were much higher than those in conventional schools in this province. The allocation of costs to meet requirements in respect of column spacing, foundations, and services indicated a very high capital cost per student in the various proposals for high-rise structures incorporating school accommodation. This may be a very costly provision of school space.

Capital support for new school construction is acknowledged in this province as well as for some renovations. There would surely be insistence that the degree of current support must be continued.

Taxpayers contribute funds to the Foundation Program Fund out of which nearly 35 millions is paid annually for debt servicing of school debentures on approved accommodation at a specified support price. Any provider of new approved school space would expect that debentures for

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I. [illegible]

II. [illegible]

III. [illegible] and Architectural Design

IV. [illegible]

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[illegible] land or [illegible] school [illegible]. Any [illegible]

it would be available to the school board through the Municipal Financing Corporation. A very large increase in costs should immediately challenge the policy of providing debentures for excess costs over the current support price.

It would appear, then, that the excess costs of the school section must be met by some other form of financing. Application of the New York practice would imply some other sale of more debentures which would, hopefully, be serviced by the revenue received by the developer from rents for the non-school portion. This might mean securing some funds on the open market without support from the Foundation Fund.

It is significant, however, that replacement or general improvement of an old school of the inner city is often desired. If no financial support is recognized a board might be able to negotiate with a developer for use of the air rights or some of the land by provision of the improvements or by sale for an amount to do them. A new building would likely need to be built beside an old school rather than incorporate the latter into an expanded structure. This would reduce the amount of playground and present other problems requiring costly solutions. Otherwise the old school might need to be demolished and one multi-use high-rise building constructed. If no government support were acknowledged than it might be assumed that the payment of costs would be made by the developer from the revenue he acquires apart from any amount he might pay as equivalent for real estate taxes.

Such a possible development might enable a school board to secure costs of considerable improvements to an old school without incurring additional requisitions. Presumably, the school board would expect to own the school space. And undoubtedly, unless an outright payment were made to

the board, it would expect some guarantee that the debt incurred would be liquidated.

One of the proposals considered was that the developer pay the tax equivalent to the city and the city would pay to the Fund a sum equal to the amount required for debt-servicing plus a reasonable amount for administrative expenses of the Fund. In any event the Fund is assured of enough revenue to meet debt-servicing, for it has the right to call on the city for contribution from the Capital Reserve Fund if needed; if the city fails to contribute enough, State aid grants may be delegated to the Fund. The city's debt limitation discourages its issuance of debentures for schools. The fund does not have this limitation and so may sell bonds and arrange for the joint-use developments and the city might expect to get the benefits of the air rights or some taxes which they would not other wise receive.

Examination of proposals did not satisfactorily substantiate the thesis of new schools at no cost to the taxpayers. If rental revenues were applied to any debentures on the school section then, presumably, less tax revenue accrues to the city.

Any exception to this conclusion might emanate from the developer paying outright for land usage and air space sufficient to offset the unsupported costs of the school section.

It may be expected that the development of the private segment of the multi-use facility must be economically viable without financial incentives involving public support. It may also be expected that the developer would receive necessary funds from conventional sources and would pay market value for leased air or other space and also pay municipal taxes.

The lease of air rights may give some financial benefit at the sacrifice of amenity.

Payment of debenture costs in lieu of taxes on the total structure from rentals received implies a loss of tax revenue during the life of the debenture (which is 40 years in New York). For example, a 150 suite apartment at approximately $200. per suite on a 40-year lease represents $300,000 per annum or $12,000,000 over the lease period.

In the Highbridge P.S. 126 the school portion should cost about 3 millions and the apartments about 8 millions. The lease of air rights would net the Fund about $85,000 per year, the equivalent of taxes on the apartments might approximate $300,000 a year. The annual debt servicing of the school portion at $240,000 a year means that the Fund should benefit by $100,000 a year during the 40 years of the debenture period.

It is significant of course, that the city does not get the tax revenue directly but it benefits in not having to pay the requisition for capital construction each year.

In Alberta it might be determined what part of the necessary debenture is not serviced from the Foundation Fund in order to decide what part of extra costs would be attributable to local requisitions.

It has been accepted that the land used for school purposes is tax exempt. But if other uses are also combined for the same land there might be charge for the land or lease of it. Possibly lease values of the land might be equated at 8 to 9% of its market value which of course varies considerably in different locations.

[illegible]

Land costs are significant and should be considered in relation to diversity of uses. They may be much higher in the central part of a city than in the suburb and thus present a potential high price for air rights or utilization of the site for multi-use. Certainly mixed-use should apply more to fully developed areas or inner city locations. Inflation of land costs affects considerations about school replacements. Beyond a certain height the cost of a building may offset the savings in land and this is noteworthy where land costs are much less than in the congested metropolic of New York. However, the total size and functional nature of the building are probably more significant factors than the cost of the land. Any decision about the optimum number of stories that will, educationally speaking, coincide with the number of stories that costs will permit is still theoretical. Ultimate economy reflects a relationship between site area and building costs as more expensive land promotes desire for taller buildings. However, significant economy arises from building larger and taller buildings rather than just tall ones to save land costs.

Nevertheless, it is noteworthy that New York has fitted the program in with a housing project to resolve two social needs. The economies of the multiple-use may thus be harder to distinguish. This may be a significant field for further study in Alberta cities with increasing emphasis on rehabiliting old homes or replacing them.

11 LEGAL IMPLICATIONS

Implementation of the proposals would raise some legal points relative to appropriate ownership of the two sections of the structure, general servicing and maintenance, and who owns the air space for leasing to the developer. Payment for use of air space might have to be subjected to auction.

There would probably need to be some statutory guarantees for bonds issued to cover unsupported costs.

The current provisions for tendering on school projects would need to be changed. Pre-qualification and accepting of tenders from various sub-trades is not in accordance with the coordination of management inherent in having one general contractor include the work of the sub-trades in his tender. It is also practice to accept the lowest tender rather than subjectively considering additional services offered. There might be some problem if more than one contractor were involved in building a multi-use building. However, new tendering procedures might permit the general contractor to serve as project manager, so that he invites and awards the sub-trade contract tenders in consultation with the owner. This might also expedite progress on the project although it would mean that the total cost price is not known when the work is already started.

It might be possible for the school board to own the site and only part of the building or to conclude some condominium arrangement or a board might undertake with a developer to build the school facilities and the board pay for them an amount reduced by the lease of land and air space. It has apparently been regarded as advisable that the Fund, Board, or City must own the school section and possibly the land as protection if the project is uneconomical.

Legal Implications

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The developer may have a problem of getting mortgage money for the non-school portion if he does not own the site or have joint ownership or some type of long-term lease. Legislation might permit legal investment in projects on a lease of land which in New York must extend 20% beyond the time of borrowing. In the Highbridge project air space was sold with the option that it might be bought back later. The whole of the Park Avenue there is generally leased from Railway which runs underneath as another example where mortgage money is advanced on leased property. Thus the lease system provides the security for the loans. Joint public-private ownership of a single multi-use building would call for firm agreements relative to operation, transfer of tenants, and financing. Extra facilities such as cafeterias, lobbies, swimming pools, might be wanted for joint community-school use. It may be noteworty that Alberta statutes do not specifically prohibit boards from renting or selling air space or first floor area. However, questions might arise about assessment on the development and possibly on the land, joint installation of services, and regulations in respect of fire hazards and use of playgrounds.

Implementation of the proposals, even for some projects would require some amendments in building and zoning bylaws and in School Building Regulations.

Undoubtedly, many of these items are matters for further study and appropriate action if implementation of the general proposal is acceptable.

111 FEATURES RELATED TO STRUCTURE AND ARCHITECTURAL DESIGN

The costs per sq. ft. of building for the piggy-back development are more expensive both for the school and for the super structure section. For example, the carrying of plumbing services up through the superstructure was a limiting factor in the Highbridge project with the result that the apartment was built beside the school.

The statement was reiterated by many officials that it was more expensive to build a school as part of a total complex.

Problems could be foreseen concerning both vertical and horizontal circulation. The demand for circulation occurs in peak loads at fixed times such as at the end of a period or a fire drill. High speed elevators have low initial cost but use a lot of space and have a limited load capacity. Often elevators only run to a certain floor and another goes to a higher floor, costs increase more after the fourth floor. Operational costs are increased by the usual need of operators and dangers are inherent in the possibility of malfunction.

Reversible escalators can be used as stairways if the power fails. The initial cost of installation is relatively high. Horizontal circulation must show concern for congestion, entrance doors, lockers, and the relationship of enrolment density to the size of corridors. Economical construction involves the smallest possible percentage for circulation such as 14 - 20% although a high building may require more for the school portion. Low buildings have a lot of corridors but high ones need much space and money for expensive elevators, reversible escalators, and stairwells.

Analysis of cost elements should indicate the most economical number of storeys for the size of the structure. The building costs should reflect actual changes in space for circulation, mechanical equipment etc, which affect the gross area as the building form changes. Foundations may be cheaper per sq. ft. but suspended floors may become costlier. Building costs may proportionately decrease for the first few stories and then increase heavily for the remaining ones. Cladding costs rise steadily in response to the formula that the costs of the external skin of a square building very directly as the square root of the number of stories. Air conditioning, affected by the number of windows, costs more proportionately for greater heights, whereas a tall narrow building may have less space needing air conditioning. Many of the Alberta schools are not air conditioned.

Many of these items cause higher unit costs for schools in large structures than in school buildings alone. Generally, schools are a few storeys unless the site is very limited. Designs in Alberta have not proposed many-storey schools.

It has been suggested that in a high-rise building:

-- It is more difficult to move partitions in the school space

-- It is harder to add more school space

-- Maintenance costs are much higher in respect of cleaning costs, ventilating systems, and upkeep of elevators and escalators.

Subsequent need for more space might be relieved by (1) adapting another floor though this would reduce rent revenue or (2) by originally planning for another floor on top or (3) by building a low addition which would, of course, reduce unoccupied land area.

The tall buildings concept evokes concern about playgrounds, circulation patterns, parking areas, traffic control, and other features.

New teaching methods, different class sizes, and changes in learning procedures may alter the demand concerning the nature of school accommodation. This is affected by the residential pattern of families. The regard for redevelopment and social changes in older areas rather than suburban development may promote replacement of old dwellings with high-rise buildings which could change enrolment density. This may be an important argument for the multi-use concept.

Replacement of old inner city schools acknowledges functional deterioration more than structural deficiencies. Course revisions, societal standards, and safety regulations repeatedly change and architectural design also succembs to the vicissitudes of fashion. Long-term utility depends on adaptability and possible renovations and the expanded multi-use concept may provide revenue for this work. This may be encouraged by contrasts with larger suburban sites. Frequently, it may not be easy to spread the replacement of an old school out over the available site as might be done with a new one on a new site in a recent development.

IV PLANNING

The compactness and high density implied by the high-rise building design are advantages for use in built-up urban areas where availability of land is limited. Mixed use indicates more intensive utilization of scarce urban space.

Land assembly is sometimes difficult to developers. Reserves may not provide sufficient land as parks and other recreational grounds are also needed. In any event the school authority or the Fund may have a site that can be developed and this may lock in the developer's proposals or impose certain limits or controls. But he is probably prepared to pay for the air space and use of some of the land.

There must be attractions for a developer. Even if he does get large financial incentives the developer would only want to build in a location that has attractiveness for tenants. In much of New York or in the inner core of any city tenants should be more readily available than in some sparsely settled area or one distinctly removed from various services. Obviously, developers must envisage sufficient profit to engage in a combined school-housing project.

The question of building multi-use schools is related to the value of the land. The issue is not one of extending borrowing power as was apparent in New York but rather of having the school property value itself contribute a substantial part of the school construction costs by selling the use of some of the land to a commercial interest. All this implies a very high land value, a very desirable location for an office or apartment complex, and in a district requiring a new school or a renewed one. Sites such as Haultain in Calgary or McKay Avenue School in Edmonton may meet such criteria if other features of planning, roads, etc. are in accord. The proposal for St. John's in Edmonton may be different,

[illegible] building design are [illegible] for use in built-up urban areas where [illegible] [illegible].

[illegible] not provide sufficient land for parks and other recreational grounds are [illegible]. In any event the school authority or the Fund may have a site. It can be developed [illegible] this may look to the developer's proposals or [illegible] contain [illegible] controls. But [illegible] probably prepared to pay for [illegible] open space [illegible] school [illegible].

[illegible] be [illegible] developer. But [illegible] [illegible] the [illegible] of [illegible] should [illegible] [illegible].

[illegible] a substantial part of the school [illegible] [illegible].

requiring further study, but it apparently indicates an annual payment for air rights along with certain tax exemptions to maintain apartment rent levels.

The reminder is expressed that residents in high-rise apartment complexes may not supply sufficient students for an effective school operation and thus students from other areas will also have to be accommodated.

Decentralization of schools may reduce transportation problems but lesson the attractiveness of a location for non-school purposes, particularly, of a commercial nature.

Associated with the demand for educational space is the urge for other public services such as rapid transit, urban renewal, and denser high-rise buildings for homes and offices. Thus provision of school space may become more interdependent with that of other urban facilities.

There may need to be a growing regard for shifts from low-density single family dwellings to medium or even high-density housing both in new development and redevelopment areas so that school facilities may need to be compatible with residential development of increasing density.

The apparent trend toward higher density may increase and public housing may move toward residential single-family buildings. Dwelling units in apartments of low rental plans may also contribute more pupils than the standard apartment house that may be envisaged for comparatively high rentals.

Again, a neglected area may become desirable as zoning changes or renewal proposals are introduced. Conditions vary - demand for schools may depend on social-community attitudes. An old community may have a majority

of the elderly people. High density distribution may still pertain to small families but as apartments deteriorate conditions may attract large families. Furthermore, if low-cost housing or apartments are set up then families may move in and sustain a fairly stable school population. If there is an old school building some multi-use may be developed on the site. But New York features of density, pollution, lack of open space, traffic and associated problems should not be considered in proposing a model for most areas in Alberta cities. The current availability of land within the scope of existing zoning regulations prompts hesitatation for disposing of parts of school sites for non-school purposes. These have potentially provided a spatial and social focus to the adjacent community. Need of such open area is usually emphasized, to lose that open space potential in an area of increasing density might be deplored and it would not likely be regained. So far schools' use of land has been set apart from use of land for other purposes and sometimes with the idea that the building should not cover more than 40% of the site. Usually the accepted figure is that the building should not occupy more than 25% of the land site. However, there may now develop interrelated investment decisions involved in the realty market. This could apply to sites in new suburban areas or to new sites or site changes in developed areas. Such a thought might prompt a board's survey of existing sites in the cities with a viewto leasing or disposing of some not serving school use in an economical manner. Possibly, increased demands in downtown areas for use of lands for parks or other community services may promote revisions in the use of public lands so that school sites may be incorporated into more diversified use without school boards relinguishing the land or control thereof. This might apply more particularly to substandard schools or to those that are drastically affected by environmental changes such as population and land shifts or freeway requirements. There is the question of retaining sites when desires for

freeways challenge the order of priorities. Certainly, consideration should have regard as to whether school redevelopment or rehabilitation should proceed having regard to land values and development prospects in the area. Any multi-use development here would likely result in better standards of facilities. Older residential districts expected to redevelop into higher density areas may require attention to the inadequacy of school facilities and promote some construction for joint use.

It is conceivable that a new development or shopping centre could incorporate multi-use buildings for school, business, or apartments although the arguments that hold for schools on separate sites would obtain here also. However, such development might save more of the reserves for park areas.

Comments about the community use of schools are somewhat parallel to other considerations in this paper. But securing of reserves and new sites challenges attention to planning for expanded use of the land for joint purposes in respect of playgrounds, swimming pools, physical education spaces, and other areas. People living in high-rise buildings hesitate to accept restrictions on the use of land as in the past for school activities although they would undoubtedly favor more community uses. They would likely not favor apartment grounds occupied by children all day. It has been pointed out that "tying the school in with an apartment project and community auditorium might destroy the privacy we have always seemed to be trying to give to students but in my view the integration of the educational process more closely into the life of the community instead of being something apart has much to commend it". It may be noted that the Calgary Parks and Recreation Department in

consultation with the Planning Department hopes to lessen construction of community association buildings by incorporating the facilities designed for community activities into proposed arena and swimming pool buildings. Possibly joint use can be further extended.

V ENVIRONMENTAL AND EDUCATIONAL CONSIDERATIONS

School boards may be inclined to assume that land availability and costs in the areas for new schools do not compel acceptance of the use of multi-use concept in a high-rise structure. A board might consider deduction of the necessary playground area and determine how high a multi-use structure must be and then consider whether it might be better to buy more land as part of a land-building cost combination. Land costs should be comparatively assessed in relation to alternate means of economizing in the site area.

A residential high-rise complex may not be particularly suitable or easily adaptable to desired elements of change. This restriction may disregard future sociological or cultural changes as well as inhibiting architectural innovations. Extending a building upward is a response to pressures of changes in variables and does not necessarily imply an extension of educational influence. Again, it might be difficult to develop esthelic building features appropriate to a low-density area of single-family dwellings though they may be appropriate or acceptable in a different environment. The symbolic impact may be important.

It is of course important to assess educational changes integrally with other possible architectural and financial changes to secure the most functional pattern of educational facility. A high building may be architecturally possible but educationally dysfunctional in respect of access to the outside, playgrounds, circulation, or shapes of workable rooms.

There could easily be a reduction in flexibility plan for the lower of two occupancies in the piggy-back combination because of the incompatability of the structural systems. Physical integration for different activities should be distinguished from actual functional relationship among the uses.

Innovation and flexibility in curricular programs demand adaptability in school facilities and this may eventually imply accommodation quite different from the traditional concept of a school building. An open building system should permit an evolving curriculum.

Special education, individualized instruction, small class groupings ancillary area, and many more curricular programs affect the kind and amount of space requirements: Need for space is dependent on cultural norms and so there is need for variety and flexibility with provision for adaptation to change. This may not be easily provided in a multi-use high-rise building.

The needs for outdoor space in the educational program need to be assessed. Variations in climate make comparisons in this regard questionable. The traditional concept about playground is still strong and defensible in many cities. In others it may yield to pressures in urban development that would impel modifications in the allocation and use of school land resources.

In New York recreation space was almost non-existent and play areas were very minimal and the Fund proposals had little regard for that space where the apartment complex was envisaged.

Rooftop playgrounds needed perimeter protection in order that children or equipment might not fall off. The area might be covered with a plastic dome which, though it sometimes leaks, may be less vulnerable to vandalism than inflatable structures.

Reducing the traditional area of playground promotes arguments for larger gymnasiums.

[illegible]

It was also noted that certain school facilities would be most convenient on first and second floors - administrative area, library, access to the outside, shops, heavy science equipment, and facilities serving the community such as the gymnasium or swimming pool. Such constraints for ground floor use would affect the overall size of structure.

So far there is nothing to indicate the attitudes of residents in the apartments toward classrooms in the lower floors. Parents might accept more readily the concept for very young children because of the relatively smaller number and because it benefits working parents. Opinion appeared to favor separation of entrances and inaccessibility of students to apartment floors.

It is also too early to discern any dissatisfaction or alienation of pupils in the environment of many not associated with the school.

SUMMARY OF CONCLUSIONS

1. The Fund was created to promote a new program of urban development with single structures under joint public-private ownership where the city's economy and social vigor share a common need for expansion. It purported to attract qualified persons and organizations and to encourage innovators to participate. It incorporated advantages in inter-government liaison, public-private ownership and expertise, maximization of land use, planning, and school revenue outside of normal sources.

2. The Fund proposal was developed to solve some of New York's problems which are not general in the urban context of Alberta. Under its authority bonds could now be issued for schools apart from the borrowing limitations of the City. The delay in securing debenture funds here or lack of support for a project may indicate some similarity to New York's former difficulty of financing schools. The Fund's methods may be valuable if they can be adapted to meet some specific school financing where desired support is not acknowledged.

3. Much of the program in New York applies to renewal programs for deteriorated schools of functional or physical deterioration. These factors apply much less in Alberta and can probably be corrected without becoming involved with other construction that will increase costs greatly and contribute other disadvantages. Any exception to this may arise from desire to renovate or replace an old school of sound structure where little or no Foundation Fund support is accorded.

4. The multi-use concept would not meet our own objectives of education and would create problems of amenity and maintenance. Any assessment of sociological effects are still chiefly subjective. Possibly, the sites in central areas should be used to provide opportunity for open space and other advantages available to children in the newly-developed areas rather than using part of them to promote developers' proposals for apartments or other commercial projects for private enterprise.

[illegible]

5. High density and multi-use in appropriate locations can provide planning advantages. The procedure permits multiple use of land of high value in high intensity development districts and may promote strong links between education and business.

Although the purpose is to build viable communities by producing new schools, sites for business and residential developments on multi-use sites it appears that physical separation is becoming favored for purposes of legal convenience, management, circulation control, and provision of tenant amenities.

The result is provision of more land for a non-school purpose and boards might well consider the effect of reduction or sites if no school advantages accrue.

Multi-purpose planning should be sensitive to inevitable inter-relationships of purposes and redefinition of purposes. If purposes are too narrowly defined the legal constraints perpetuate the idea of single-purpose planning. The division of jurisdiction and financial support inhibit multi-purpose planning although support should be related to necessary cost of providing school accommodation. It is conceded that the high-rise concept may eventually change methods of securing more schools and it has been suggested that private developers may assume an increasingly active role. The current developments in many suburbs have created desire for more schools which added to existing ones would provide more space than required for the total school population.

6. It was generally acknowledged that costs for school construction were higher if it were included in the high-rise structure. These higher costs as compared to Alberta's relatively inexpensive costs of building imply uneconomical construction under the tower concept.

7. The "free school" concept is questionable. The City would have provided the money for school construction and now the equivalent of tax money from the non-school portion theoretically pays for the school. The lease of air rights does give some added benefit. Interrelated with the financial considerations was the subsidization of low-cost housing. Application in Alberta might mean that some debenture funds would usually be anticipated and the city might be expected to give up some of the tax levy to meet additional costs.

8. Difficulties, including physical limitations of mixed use were compounded in New York by the nature of the financial structure and legal restraints which were to be obviated by statutory authority accorded to the Fund.

Legal problems in Alberta pertain to separate tendering procedures, site ownership and control, dual methods of financing, and possibly, the need of a special agency to implement the program for schools in multi-use structures. Presumably, school boards could do this as they have authority to sell debentures now.

9. Because of financial involvements and environmental limitations of the Education Fund there is considerable reluctance to recommend its general application to Alberta. A very few isolated examples might be studied further to determine the feasibility of introducing some modification of the program in respect of them or seeking other alternatives of action.

RECOMMENDATIONS

1. Interest in the Fund operation of New York should not subside without some pursuant action. School Boards of Edmonton and Calgary should be informed about the proposal. Discussions might be arranged with each of the city boards about more details of its nature and the economic and functional factors involved. Concern about a particular project might then prompt study of how the procedures could be feasibly invoked. For example, the liaison committee in Calgary representative of the school boards and the city might wish to explore the possibilities of the proposal or other possible alternatives.

2. Any such studies could be supplemented through a survey by a committee from the Departments of Education and Municipal Affairs along with representatives from the levels of local government. This implies an assumption that possibilities exist for taking advantage of the Fund method in financing public facilities in redevelopment and in combined ownership of multi-use structures without jeopardizing the optimum educational environment. Such study might envisage a survey of other factors relative to pupil transportation, rapid transit, or future open area.

3. If favor developed for pursuing some agreement with a developer then enabling legislation with pertinent safeguards, appropriate architectural design, and acknowledged financial support for school space might be proposed. This should assist boards in formulating discussions with city authorities and in negotiating some agreements for joint occupancy buildings with desired property controls under, wherever possible, some unified authority.

4. Boards might be encouraged to examine existing sites to consider if any would be suitable for such multi-use high-rise development. This might apply, particularly, to central city locations where desired replacement or improvement needs more funds than currently provided under existing Building Regulations.

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This should stimulate attention to substandard schools that are drastically affected by environmental change such as population and land use shifts or freeway requirements, to consider whether school redevelopment or rehabilitation though desirable, may be prohibitive in cost in relation to the priority assigned to it. Such a review would have regard for land values and development prospects in the vicinity.

It should also promote examination of the possibilities for more community use of some schools and sites.